

REMARKS/ARGUMENTS

Please reconsider the application in view of the following remarks. The Applicants thank the Examiner for acknowledging the claim for domestic priority under 35 U.S.C. 119(e).

Disposition of Claims

Claims 1-4, 11, 40-41, and 62 are canceled.

Claims 36, and 37 are withdrawn from further consideration.

Claims 5-10, 12-35, 38-39, 42-61, and 63-73 are pending in this application.

Objection

Listing of claims 1-3 and 11 as “withdrawn” are objected to as being improper. The claims 1-3 and 11 are cancelled by way of this response. Therefore the objection is now moot.

Claim 42 is objected to as being improper. A typographical error is corrected by replacing a period by a comma to address the objection. Withdrawal of this objection is therefore requested.

Claim rejection under 35 U.S.C. 101

Claims 39-41 and 70 are rejected under 35 U.S.C. 101 as being directed toward non-statutory subject matter. Claims 40-41 are cancelled by way of this response and therefore the rejection is now moot. Claims 39 and 70 are amended to direct to a computer readable medium comprising the data structure representation.

As for the analogy indicated by the Examiner with respect to the Patent Office’s computers, claims 39 as amended includes the limitation of being readable by a computer for directing a process of design simulation, design synthesis, design layout, design verification, or maskwork generation to distinguish from what is stored in Patent Office’s computer.; and claim 70 as amended includes the limitation of being a specification for an integrated circuit netlist, a netlist, a CAD (computer-aided design) representation, or a hardware definition language representation to distinguish from what is stored in Patent Office’s computer.

Accordingly, the withdrawal of this rejection is requested.

Claim rejection under 35 U.S.C. 102

The following is one basis for the Applicants' arguments in response to the rejections under 35 U.S.C. § 102: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference [emphasis added]." Further, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." (MPEP § 2131.)

Claims 42 and 43

Claims 42 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Rottmann U.S. 3,442,583 (hereto after referred to as "Rottmann"). This rejection is respectfully traversed. The Applicants respectfully assert that Rottmann does not expressly or inherently describe each and every element of the rejected claims considering the amendments described below.

Claims 42 and 43 are amended to eliminate the "adapted to" language so as to specifically require the limitation of defining a germanium on silicon waveguide photodetector, which is not disclosed by "Rottmann". Therefore, the claims 42 and 43 as amended are not anticipated by "Rottmann" and withdrawal of this rejection is requested.

Claims 1, 2, 5-38, 42-61, 63-69, and 71-73

Claims 1, 2, 5-38, 42-61, 63-69, and 71-73 are rejected under 35 U.S.C. 102(e) as being anticipated by Knights et al. U.S. 2006/00399666 (hereto after referred to as "Knights"). This rejection is respectfully traversed. The Applicants respectfully assert that Knights does not expressly or inherently describe each and every element of the rejected claims considering the amendments described below.

Claims 1-4 and 11 are cancelled and therefore the rejection is now moot with respect to claims 1-4 and 11.

Independent claims 5, 12, 21, 22, 24, 25, 28, 39, 42, 45, 46, 63-65, and 70 are amended to include the limitation "wherein at least a portion of a CMOS transistor and the silicon (layer) of

the core of the waveguide are formed from a starting silicon layer, and wherein at least one conductive contact of the first and the second pluralities of conductive contacts is operatively coupled to the CMOS transistor”. Independent claims 20, 51, and 60 are amended to include the limitation “wherein at least a portion of the CMOS integrated circuit and the silicon of the core of the waveguide are formed from a starting silicon layer”. Independent claims 59 and 72 are amended to include the limitation “where at least a portion of the CMOS element is comprised in the silicon”. Independent claims 61, 71, and 73 are amended to include the limitation “wherein the CMOS transistor body and the silicon of the core of the waveguide are formed from a starting silicon layer”. Support of these amendments may be found in figure 8 and related description in the instant application.

Turning to the rejection, Knights discloses an integrated optical waveguide, which is an integrated optical circuit but not an integrated opto-electronic circuit. Knights discloses connecting the waveguide photodiode to an electrical circuit, but never explicitly teaches the fabrication of transistors at the same time as the waveguide on the same substrate. On the contrary, Knights discloses that the dimensions of the waveguide is typically in the range 1-10 microns (see paragraph [0044] of Knights”), which is much thicker than commonly used silicon thicknesses in silicon-on-insulator integrated electronic circuits at the time of filing of Knights (which is typically in the 0.1 microns (μm) range, *see* for example Sleight, J. W., et al. “A High Performance 0.13 μm SOI CMOS Technology with a 70 nm Silicon Film and with a Second Generation Low-k Cu BEOL,” Electron Devices Meeting, 2001, IEDM Technical Digest, page 11.3.1-11.3 (2001)). Therefore Knights does not expressly or inherently describe or even anticipate the monolithic integration of photonics and electronics on the same chip. Accordingly, Knights does not describe each and every elements of the amended independent claims 5, 12, 20, 22, 24, 25, 28, 39, 42, 45, 46, 51, 59-61, 63-65, and 70-73, which are therefore not anticipated by Knights. The rest of the claims in 1, 2, 5-38, 42-61, 63-69, and 71-73 depend, directly or indirectly, from these independent claims and therefore are not anticipated by Knights for at least the same reason. Withdrawal of the rejections under 35 U.S.C. § 102 is therefore requested.

Claims 1, 2, 5-38, 42-61, 63-69, and 71-73

Claims 1, 2, 5-38, 42-61, 63-69, and 71-73 are rejected under 35 U.S.C. 102(b) as being anticipated by Delwala et al. U.S. 2002/0172464 (hereto after referred to as “Delwala”). This rejection is respectfully traversed. The Applicants respectfully assert that Delwala does not expressly or inherently describe each and every element of the rejected claims.

Claims 1-4 and 11 are cancelled and therefore the rejection is now moot with respect to claims 1-4 and 11.

Independent claims 5, 12, 21, 22, 24, 25, 28, 39, 42, 45, 46, 63-65, and 70 include the limitation of a photodetector having a germanium on silicon heterojunction comprising a germanium layer.

Turning to the rejection, although Delwala discloses integration of optics and electronics in optical waveguide devices, Delwala does not expressly or inherently describe a waveguide photodetector. All the “active” devices referred to by Delwala are devices that control the propagation of light by application of an electrical signal, while photodetectors perform a very different operation of converting an optical signal to an electrical signal. This is made clear by claim 7 of Delwala, where none of the claimed active optical waveguide devices are photodiodes or photodetectors.

Further, Delwala clearly does not expressly or inherently describe a germanium photodetectors, restricting his discussion to polysilicon or polysilicon-germanium (a silicon alloy) deposited materials, rather than epitaxial germanium layer forming the germanium on silicon heterojunction as in the instant application, which is necessary for the proper operation of a photodetector. Therefore Delwala does not expressly or inherently describe a photodetector having a germanium on silicon heterojunction comprising a germanium layer. Accordingly, Delwala does not describe each and every elements of the independent claims 5, 12, 20,-22, 24, 25, 28, 39, 42, 45, 46, 51, 59-61, 63-65, and 70-73, which are therefore not anticipated by Delwala. The rest of the claims in 1, 2, 5-38, 42-61, 63-69, and 71-73 depend, directly or indirectly, from these independent claims and therefore are not anticipated by Delwala for at least the same reason. Withdrawal of the rejections under 35 U.S.C. § 102 is therefore requested.

Conclusion

In view of the foregoing, Applicant believes that all of the claims 5-10, 12-35, 38-39, 42-61, and 63-73 are now in condition for allowance and respectfully requests the Examiner to issue a timely Notice of Allowance. If for any reason, the Examiner believes any of the claims are not in condition for allowance, he is encouraged to phone the undersigned at (650) 325-4999 so that any remaining issues may be resolved.

Respectfully submitted,

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